

# SSA Tolerances for Accelerator Applications

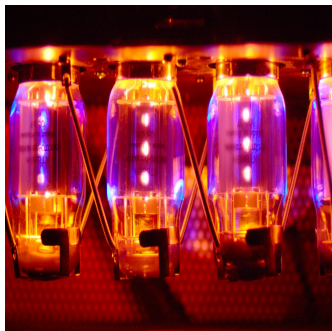
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# Power Amplifiers

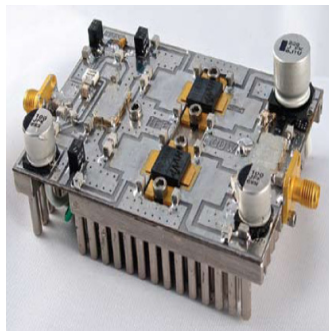
## Tube Amplifiers

High Power (MegaWatts)  
In use for almost a century  
Prohibitively Expensive



## Solid State Amplifiers

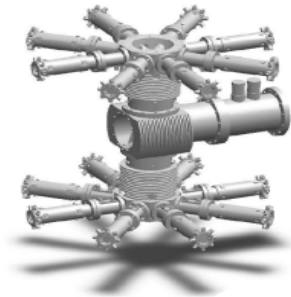
Lower Power (KiloWatts)  
Requires a combiner  
Easily Manufactured



# Power Combiners

## Coaxial Tree

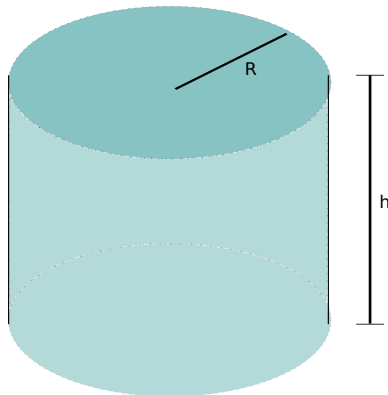
Simple Theoretical Background  
Very Large Size  
Losses related to Coaxial  
Transmission line



Taken from ESRF May 2014

## Cavity Combiner

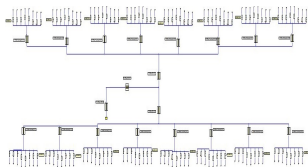
Complicated Background  
Relatively Small Size (0.5 meters)  
Significantly lower losses



# CST Simulations

## Coaxial Tree

1-D assumptions not valid  
Circuit and 3-D Simulations  
Minimize  $S_{11}$



## Cavity Combiner

Simple Geometry  
Eigenmode / Frequency Sim.  
Maximize  $\beta, \frac{Q_0}{Q_{ext}}$

